

Attorney Docket No. U 0186 OS/MINPT
Serial No. 10/631,299
Art Unit: 1742
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REMARKS/ARGUMENTS

Amendments to the Claims

By the above Listing of Claims, claim 12 is amended and new dependent claims 33-35 are added. The amendment to claim 12 and new claims add no new matter. Upon entry of the amendments, claims 1, 9-12 and 26-35 will be pending.

Claim 12 is amended to add the missing word "which" in line 10.

New Claim 33, dependent on method of claim 10, states that the solvent extraction circuit also comprises a wash or scrubbing stage, which is supported on page 6, lines 7-8 of the specification.

New Claim 34, dependent on method of claim 12, states that the metal solvent extraction plant is a copper metal solvent extraction plant, which is supported on page 3, lines 1-3 of the specification.

New Claim 35, dependent on method of claim 12, states that the solvent extraction circuit also comprises a wash or scrubbing stage, which is supported on page 6, lines 7-8 of the specification.

Accordingly, Applicants believe that entry of the amendments correcting claim 12 and adding new dependent claims 33-35 presented in the foregoing Listing of Claims is proper. Such entry and allowance of the remaining rejected claims 1 and 9-12 (plus new claims 33-35), for the reasons presented in applicants' RCE Submission paper dated May 22, 2006, and below are therefore respectfully solicited.

Allowance of claim 26-32

Applicants thank the examiner for noting that claims 26-32 are allowed.

Rejections Under 35 USC §103(a) for Obviousness

Pending claims 1 and 9-12 (and new dependent claims 33-35) are again rejected for obviousness.

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The criteria for establishing a *prima facie* case of obviousness are well set out in MPEP 2142, as follows:

MPEP 2142 Legal Concept of - 2100 Patentability, under the second heading states the three elements needed to establish a *prima facie* case of obviousness:

"ESTABLISHING A *PRIMA FACIE* CASE OF OBVIOUSNESS"

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria.

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). See MPEP § 2144 - § 2144.09 for examples of reasoning supporting obviousness rejections"

(Underlining added.)

The Examiner has Failed to Establish the Criteria for *Prima Facie* Obviousness

(A) Claims 1, 10-12, Stand Rejected As Obvious Under 35 USC §103(a) Over Domic et al. (US Patent No. 4,028,462).

Applicants respectfully request reconsideration and withdrawal of this rejection in view of the following discussion of the teachings of the reference with respect to applicants' pending claims.

Applicants' independent claims 1, 10 and 12 each require an extraction/stripping circuit having the specific combination of three extraction stages (in series with countercurrent flow) in

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Applicants' independent claims 1, 10 and 12 each require an extraction/stripping circuit having the specific combination of three extraction stages (in series with countercurrent flow) in combination with only one stripping stage. As stated in MPEP 2142 above, the teaching of the prior art must be directed to **all of the limitations of the claims**. Thus, the examiner's rejections must be directed at the **presently claimed combination of three extraction stages and only one stripping stage** and not to just a single stripping stage with any number of extraction stages.

(1) The conventional Extraction/Stripping Circuits in Figures 1, 2 and 3 of Domic et al. teach away from applicants' claimed combination of the three extraction stages and 1 stripping stage. Figures 1, 2 and 3 of Domic et al. show conventional extraction/stripping circuit configurations having, respectively, Co-current, Counter-current and Cross flow. Applicants again note that each of the described Figures 1, 2 and 3 of Domic et al. shows three successive extraction stages and two successive stripping stages - thereby always teaching away from applicants' claimed invention. (Figure 2, with Counter-current flow, is the most relevant of these conventional extraction/stripping circuits to applicants' claimed invention.)

(2) The inventive Extraction/Stripping circuits of Domic et al. require 3 stripping stages with 3 extraction stages. Applicants submit that Domic et al. specifically teaches away from only one stripping stage when **three extraction stages are present**. In the invention of Domic et al., three stripping stages are required with the three extraction stages in order to obtain the objective of Domic et al. to alternate the loading and unloading, i.e., extraction and stripping, functions. Thus, at col. 3, lines 56-64, Domic et al. states:

"The way to improve this driving force is to discharge partially the organic phase, before EACH EXTRACTION STEP, so the avidity of the organic phase is always maintained in a high level in such a way that its effective charge is greatly improved per cycle.

The present invention relates to a procedure intended to load or unload (partially or fully) the organic phase in an ALTERNATE manner."

(Capitalization in the original.)

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(3) The Example Table and results of Domic et al. clearly demonstrate that the invention of Domic et al. requires 3 stripping stages with 3 extraction stages. The operation of the Domic et al. inventive concept is shown in the Example Table of Domic et al. CASES a, b and c of the Example Table show the result for the 3 extraction stage/2 stripping stages of the conventional circuits of Figures 1, 2 and 3. CASE d of the Example Table demonstrates the superior results for the inventive alternating flow of Fig. 6 and thus includes 3 stripping stages with 3 extraction stages.

(4) Contrary to the examiner's assertion, the claims of Domic et al. also require 3 stripping stages with 3 extraction stages - adversely to present applicants' claims 1, 10 and 12.

Contrary to the examiner's statement, the claims of Domic et al. also do not allow for only one stripping stage were there are three extraction stages. Claim 1 of Domic et al. clearly shows the requirement for alternating extraction and stripping stages, as follows:

1. In a liquid-liquid extraction process for the extraction of a constituent from an aqueous solution through the use of an organic solvent, in which process said constituent is extracted from the aqueous feed solution into said organic solvent and backwashed into an aqueous elution solution, wherein successive extraction and successive elution contacts occur, the improvement comprising
partially discharging said constituent from said organic solvent through contact of said organic solvent with said aqueous elution solution after each extraction contact.

(Italics and underlining added)

Claims 2 and 3 of Domic et al. similarly require a stripping stage after each extraction stage, i.e. a 1:1 ratio of stripping stages to extraction stages. Claims 4, 6 and 8 of Domic et al. express the same concept in more mathematical terms - which are that: for n extraction stages there are always n elution (stripping) stages. Thus, all of the claims of Domic et al. teach that with 3 extraction stages there must be 3 stripping stages - not 1 stripping stage with 3 extraction stages as in applicants' claims.

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(5) Contrary to the examiner's assertion, there is simply no teaching in Domic et al. directed to only one stripping stage. Domic et al. does not teach or suggest anything less than two stripping stages with three extraction stages - either conceptually or mathematically or by example. Moreover, to apply the teaching of Domic et al. to an extraction/stripping circuit having only one stripping stage would require that such circuit contain only one extraction circuit.

Applicants submit that the examiner's reading of these claims to allow a single stripping stage with three extraction stages is simply incorrect. Contrary to the examiner's statement in the final action, Domic et al. does indeed **require at least three stripping stages with three extraction stages.**

The examiner has failed to establish a *prima facie* case of obviousness because he has not shown how Domic et al. teaches or suggests all of the limitations of applicants' claims. He has not shown that Domic et al. provides any motivation to change its disclosed extraction/stripping circuits to applicants' configuration having three extraction stages in combination with one stripping stage. Nor, has the examiner shown that Domic et al. provides any assurance of success in making such modifications. In fact, Domic et al. teaches away from such assurance of success.

Moreover, applicants submit that MPEP 2144.04 II B: "Omission of an Element with Retention of the Element's Function Is an Indicia of Unobviousness", and not MPEP 2144.04 II A applies here. A second and third stripping stage are clearly needed in the Domic et al. configurations having three extraction stages. Applicants' *are the first to show* that improved metal recovery can be obtained *with the omission* of the second and third stripping stages in an extraction circuit configuration having three extraction stages connected in series with countercurrent flow.

For these reasons, Applicants respectfully submit that the examiner cannot establish a *prima facie* case of obviousness of the combination of three extraction stages with one stripping stage

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in rejected claims 1 and 9-12 (and new dependent claims 33-35) over Domic et al. Applicants therefore respectfully request withdrawal of the rejection under 35 USC §103(a) for obviousness over Domic et al.

(B) Claims 1 and 9-12 Stand Finally Rejected For Obviousness Over Lower (US Patent No. 3,429,694) and Pang (US Patent No. 3,697,400).

The examiner states that both Lower, in the embodiment of Figure 1, and Pang, also in the embodiment of Figure 1, "teach a method and apparatus for counter current solvent extraction of copper values comprising at least 3 counter current extraction stages, a wash, or filter stage and a strip stage, thereby showing all aspects of the above claims, except the use of only a single strip stage and three extraction stages." (emphasis added)

The examiner states further: "... both Lower and Pang never require any specific number of stripping or extraction stages and broadly include arrangements with only a single stripping stage and three extraction stage."

The examiner then cites MPEP 2144.04 IIA, "Omission of an Element and Its Function Is Obvious If the Function of the Element Is Not Desired", for the proposition that it is well settled that elimination of an element in an apparatus or step along with the element's or step's function would be a modification obvious to one of ordinary skill in the art. Thereafter, the examiner states: "In the instant case, elimination of all but one of the stripping stage in either of Pang and Lower where lower copper value recovery is acceptable, would have been a modification obvious to one of ordinary skill in the art at the time the invention was made."

Applicants again state that the examiner's rejections must be directed at the present combination of three extraction stages and only one stripping stage and not to just a single stripping stage with any number of extraction stages. Without the teaching suggestion or motivation to combine only one stripping stage with three extraction stages, as required by the

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limitations of applicants' claims, neither Pang nor Lower nor their combination can establish a *prima facie* case of obviousness.

The claims of both Lower and Pang refer only to "extracting" and "stripping" and *are silent with respect to "extraction stages" or "stripping stages" or the number of either.* Thus, any inferences about the number and combination of extraction stages and stripping stages must be drawn from the specification and drawings of each reference.

(1) Lower makes no general statement about the number of extraction stages. The only mention in the specification of Lower of the number of extraction stages and stripping stages is in the two examples. In both examples *four* extraction stages and *four* stripping stages are used - as in the Drawing of Lower. Thus, there is *no basis in Lower* for a suggestion that either three extraction stages or one stripping stage be used - let alone a basis for a suggestion of this exact combination of extraction and stripping stages. Nor, is there any motivation to use either less than four extraction stages or less than four stripping stages, let alone the motivation to use applicants' combination of the three extraction stages and only one stripping stage. (The primary reason for this is that the invention and disclosure of Lower are directed primarily to extractants for extraction of copper cyanide and not to the extraction or stripping processes or circuits or stages themselves.)

(2) Pang only provides motivation for four or more extraction stages and two or more stripping stages. The only mention in the specification of Pang of the number of extraction and stripping stages is in examples 9 and 10. In example 9, *five* extraction stages and *two* stripping stages are used. Example 9 of Pang, at col. 12, lines 30-37 and 43-45 states further:

The number of stages of countercurrent extraction varies with the type of equipment, and other flow sheet details. For conventional type extractors, from 3 to 9 stages normally can be considered as an economical range for either AMQA-solvent of copper or for the strong acid stripping of copper from the copper loaded chelate to form the electrolytic cell feed."

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With more stages, a more completely copper loaded solvent phase, or strong acid phase
is obtainable, but the cost of equipment is higher.
(underlining added)

Example 10 of Pang refers to the drawing which shows *four* extraction stages in combination with *four* stripping stages - as in Lower. Thus, there is *no basis in Pang* for a suggestion that either three extraction stages or one stripping stage be used - let alone for a suggestion of this exact combination of three extraction stages and one stripping stage. The suggestions/motivation of Pang are indeed contrary to applicants'. (In Pang the invention and disclosure are also directed primarily to the extractants and not the extraction or stripping processes themselves.)

(3) Lower and Pang, the prior art as a whole in this obviousness rejection, do not provide a basis to apply MPEP 2144.04 II A: "Omission of an Element and Its Function Is Obvious If the Function of the Element Is Not Desired". Lower and Pang each teach the opposite of MPEP 2144.04 II A, namely, that more extraction and more stripping stages are indeed desired. Thus, MPEP 2144.04 II A: is contrary to the very prior art which the examiner relies on.

In fact, in view of the teachings of Pang in particular, MPEP 2144.04 II B: "Omission of an Element with Retention of the Element's Function Is an Indicia of Unobviousness" is applicable here.

The examiner has failed to establish a *prima facie* case of obviousness because he has not shown how Lower and Pang, individually or taken together, teach or suggest all of the limitations of applicants' claims. He has not shown that Lower and Pang provide any motivation to change their disclosed extraction/stripping circuit to applicants' 3/1 configuration. Nor, has the examiner shown that Lower and Pang, either individually or taken together, provide any assurance of success in making such modifications. In fact, Lower and Pang each teach away from such assurance of success. Applicants therefore respectfully request withdrawal of the rejection under 35 USC §103(a) for obviousness over Lower and Pang.

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(C) The Art As A Whole Includes Domic Et Al., Lower And Pang Which, In Total, Demonstrate The Unobviousness Of Applicants' Invention of Claims 1 and 9-12

*Applicants submit further that "the art as a whole" in this case includes Domic et al., Lower and Pang even though they are not combined in a single rejection. Domic et al. is the most relevant to applicants' claimed combination of three extraction and one stripping stage because its invention and disclosure are directed to the number and configuration of extraction and stripping stages. However, as noted above, its inventive teaching precludes applicants' claimed combination. Applicants submit that Lower and Pang further teach away from their claimed combination by teaching the desirability of both more extraction and more stripping stages than in applicants' claimed combination. Thus, withdrawal of the rejections of pending claims 1 and 9-12 for obviousness is further solicited because the "art as a whole" from both rejections fails to establish a *prima facie* case of obviousness, and, in fact, teaches away from applicants' claimed invention.*

Applicants believe that the foregoing amendments and Remarks/Arguments constitute a complete response to the rejection in the Office Action of July 12, 2006, in this Continuing Examination and that all grounds of rejection are completely avoided and/or overcome.

Applicants therefore respectfully request that a timely Notice of Allowance, including pending claims 1 and 9-12 (plus 33-35) together with previously allowed claims 26-32, be issued in this application.

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The Examiner is requested to telephone the undersigned attorney if any further questions remain which can be resolved by a telephone interview.

Respectfully submitted,

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(Date)

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